Technology Innovation Project *Project Brief*

TIP 270: *Demand Response Demonstration Market*

Context

Many regions of North America are struggling with the integration of new variable renewable energy generation resources. The Pacific Northwest in particular, faces a continuing rapid increase of wind generation in the region, with hydropower is the primary source of generation. Since it too is a variable resource, keeping regional power systems in balance creates some unique power system challenges.

BPA and regional utilities are pursuing demand response as one of the stack of future flexible tools that will be used to supplement careful hydropower operations management. Specifically, BPA is testing the use of DR for increasing and decreasing load to balance generation variability. That's in addition to using DR for traditional load shifting to shave system peaks to help utilities address their constraints.

The City of Port Angeles, WA located on the Olympic Peninsula in Washington State, has been a leader in collaborating with BPA to develop demand response programs in the Pacific Northwest. The City has used programs to help keep its rates low and reduce system constraints, as well as help the region test ways to integrate renewable resources and address transmission constraints given its location on a capacity-constrained single feed radial transmission system. The development of wide-scale demand response options has the potential to further benefit the City and the region.

Description

Port Angeles is actively involved in upgrading its electric utility to an advanced metering infrastructure system. As part of the upgrade, the City is interested in developing and implementing a secondary infrastructure for Demand Response within its service territory. ADR, combined with the metering, will provide the City with a dynamic energy management system capable of both load decreases and increases.

- Port Angeles has commercial and industrial loads of significant size that can respond quickly to a need. The City has an electric boiler (22 kW) at its City Hall Complex and can achieve dispatch of a load decrease in the ten-minute timeframe required.
- Catalyst Energy Technologies has installed a lithium-ion battery referred to as the Smart Storage Kit™ at The Landing mall in Port Angeles, capable of storing up to 40 kWh and dispatch of a load decrease.

Port Angeles will work with BPA to create and analyze an internal and external demonstration market for load decreases, and potentially load increases at industrial, commercial, and municipal government customer locations. The goal is to move the individual technical demand response pilot projects further towards a realistic DR market by working out many of the remaining institutional issues. The specific goal of this project is to demonstrate the ability of BPA, the City and the city customers to operate a DR market for balancing services.

Why It Matters

BPA faces significant balancing reserve demands to integrate increasing amounts of wind within the next few years. Additional renewable development is expected, further affecting borrowing authority, oversupply, siting and reserve capacity challenges. In some of these cases, DR may be part of a cost-effective solution to help delay or avoid transmission construction.

BPA is looking for innovation of emerging DR technologies to solve operational challenges, including the operational reserve and capacity constraints caused by increased wind generation and transmission expansion challenges. This project promotes the use of dispatchable DR within 10 minutes to increase or decrease regional loads and to maintain regional grid stability.

Goals and Objectives

The goal of this project is to measure, verify and evaluate the described loads to demonstrate the commercial application of a market for dispatchable DR market for increases and decreases in load, , meeting the following objectives:

- Reduce or shift the City's peak demand
- Provide regional balancing reserves
- Determine the market values for DR's ability to increase and decrease load that is required for developing a commercial ancillary services market using non-generation assets.
- Delay or eliminate regional transmission system upgrades

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Project Start Date: October 1, 2012

Project End Date: September 30, 2014

Reports & References (Optional)

Links (Optional)

Funding

Total Project Cost:	$1,000,000
BPA Share:	$500,000
External Share:	$500,000
BPA FY2013 Budget:	$100,000

For More Information Contact:

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